Office of Technical Assistance Research Proposal

Lithographic Printing Blanket Wash

BACKGROUND

Current Blanket washes contain from 10 to 15% TMB (1,2,4, trimethyl benzene). Blanket washes with less TMB are not effective in press clean up. Studies conducted by EPA and TURI show that the maximum effective dilution ratio is 2:1 blanket wash to water. Diluting blanket washes beyond that, results in slow drying time and ineffective clean up. It is estimated that >1 million gallons of blanket wash which contains 12 - 15% 1,2,4 trimethyl benzene, are used every year in Massachusetts. For the Printers Partnership Initiative, the DEP had a list of 2200 printers operating in Massachusetts, the bulk of which are lithographic printers.

The clean up effectiveness of the blanket wash is determined by the solubility of the ink on the press. The solubility of the ink is determined by the basic ingredients in the ink formula not the least of which is the solvent. The solvent in most cases can have a determining effect on the solubility characteristics of the overall ink formula.

OBJECTIVES

Determine the solubility parameters of the various resin polymers used as binders in formulating heat set and non heat set lithographic inks. The resins used for these studies should not contain any solvent or other ingredients. This way the solubility of the resins alone will be considered. It is suggested that Hanson Parameters be used to determine the most effective solvent(s) for each resin type.

SCOPE OF WORK

Outline of study:

1) Determine the solubility of the resins in various organic solvents using Hanson Parameters. Compare these solvent/resin combinations with their commercial counterparts.
2) Using the organic solvent species determined to be most effective , identify those that would be compatible with water or would act as ligands for resin and water. Next, determine limits of solubility of the binders in various water/solvent combinations.
3) Determine the solubility in other less toxic solvents such as IPA or ethanol.
4) Design resin/binder system using a solvent system that allows for easy dissolution with a blanket wash that has been diluted (significantly>35%) with water.
5) Formulate a complete ink using the materials parameters determined above and test its solubility/cleanabllity in the optimum solvent combination determined above.

Two specific companies may have an interest in collaborating or participating in this project: a leader in the development of low VOC fountain solutions that is a major supplier of blanket wash and other chemicals to the printing industry and a company that has made dramatic reductions in VOC by adopting such low VOC solutions.